

What is claimed is:

1. An input apparatus that is provided on a housing of a portable electronic device and with which an input operation by a user is performed,  
5 comprising:

a contact detection sensor, which is provided near a rotating component of said portable electronic device, and which detects contact by a living body or an object based on an input operation by said user with a portion of a surface of a cylindrical member as a detection area;

10 control means, which performs input processing for accepting input of a predetermined function in accordance with a contact position, a change in said contact position or the area of a contacted portion detected by said contact detection sensor, and which outputs an actuating signal based on a change in said contact position of or above a predetermined amount and/or  
15 the size of said area of said contacted portion; and

an actuator for temporarily vibrating at least an area close to where said contact detection sensor is provided by said actuating signal outputted by said control means.

20 2. The input apparatus according to claim 1, wherein

said contact detection sensor has one or more transmission electrodes to which a specifying signal from a signal source is supplied, and one or more reception electrodes, which are positioned close to said one or more transmission electrodes while being mutually insulated, arranged in  
25 said detection area in a predetermined state, and

said control means detects said contact position based on a signal strength of said specifying signal obtained by said one or more reception electrodes.

30 3. The input apparatus according to claim 1, wherein

said contact detection sensor has one or more first transmission

electrodes and one or more second transmission electrodes, which is/are positioned close to said first one or more transmission electrodes while being mutually insulated, arranged within said detection area, and a specifying signal from a signal source is supplied to said one or more first and second  
5 transmission electrodes,

said contact detection sensor has at least one reception electrode that is insulated from said first and second transmission electrodes and is provided outside said detection area, and

said control means detects said contact position based on a signal  
10 strength of said specifying signal obtained by said one or more reception electrodes.

4. The input apparatus according to claim 1, wherein said control means judges an input operation by said user to be a rotational operation  
15 based on a change in said contact position of a predetermined amount in a circumferential direction on said surface of said cylindrical member detected by said contact detection sensor, and judges an input operation by said user to be a pressing operation in accordance with said area of said contacted portion detected by said contact detection sensor.

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5. The input apparatus according to claim 1, wherein said control means judges an input operation by said user to be a rotational operation based on a change in said contact position of a predetermined amount in a circumferential direction on said surface of said cylindrical member detected  
25 by said contact detection sensor, and judges an input operation by said user to be an operation different from said rotational operation in accordance with a change in said contact position of a predetermined amount in a direction that is orthogonal to said circumferential direction on said surface of said cylindrical member detected by said contact detection sensor.

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6. The input apparatus according to claim 1, wherein said rotating

component is cylindrical, and said contact detection sensor is so provided that a surface of said cylindrical rotating component is said detection area.

7. A portable electronic device, comprising:

5 an input apparatus including:

a rotating component;

a contact detection sensor that is provided close to said rotating component and that detects contact by a living organism or by an object based on an input operation by a user with a portion of a surface of a cylindrical member as a detection area;

10 control means that performs input processing for accepting input of a predetermined function in accordance with a contact position, a change in said contact position and the area of a contacted portion detected by said contact detection sensor, and that outputs an actuating signal based on a change in said contact position of or above a predetermined amount or the area of said contacted portion; and

an actuator that temporarily vibrates at least an area that is close to where said contact detection sensor is provided; and

information processing means for performing information processing as desired by said user in accordance with an input from said input apparatus.

8. The portable electronic device according to claim 7, wherein

25 said rotating component is a joint section that joins a first housing and a second housing so as to be foldable, and

said input apparatus is so provided that a surface of said joint section is said detection area.

9. The portable electronic device according to claim 8, wherein

30 said joint section is exposed even when said first housing and said second housing are folded together, and

said input apparatus also takes an exposed surface of said joint section while folded to be said detection area.

10. The portable electronic device according to claim 9, wherein

5 first display means for displaying information processing results and progress in information processing by said information processing means is provided on a surface of one of said first housing and said second housing facing the other housing, and

10 second display means with respect to which an operation is performed through said input apparatus in an operation mode that is different from an operation mode for said first display means is provided on one of said first housing and said second housing on a surface on a side opposite to a surface facing the other housing.

15 11. The portable electronic device according to claim 10, wherein when it is detected that said first housing and said second housing are folded together, an operation mode of said input apparatus with respect to said first display means and said second display means is altered.

20 12. An input method for a portable electronic device including a rotating component, comprising:

an input processing step of performing input processing for accepting input of a predetermined function in accordance with a contact position, a change in said contact position, or the area of a contacted portion detected by  
25 a contact detection sensor that is provided close to said rotating component and that detects contact by a living organism or by an object based on an input operation by a user with a portion of a surface of a cylindrical member as a detection area;

an actuating signal outputting step of outputting an actuating signal  
30 based on a change in said contact position of or above a predetermined amount or a size of the area of said contacted portion; and

a vibrating step of temporarily vibrating at least an area close to where said contact detection sensor is provided by said actuating signal outputted in said actuating signal outputting step.

5 13. The input method for said portable electronic device according to claim 12, wherein

said rotating component is a joint section for joining a first housing and a second housing so as to be foldable, and

10 a portion of a surface of said joint section is taken to be said detection area in said input processing step.

14. The input method for said portable electronic device according to claim 13, wherein

15 said joint section is exposed even when said first housing and said second housing are folded together, and

a surface of said joint section that is exposed while folded is also taken to be said detection area in said input processing step.

20 15. The input method for said portable electronic device according to claim 14, wherein

first display means for displaying an information processing result and progress in information processing is provided on one of said first housing and said second housing on a surface that faces the other housing when said first housing and second housing are folded together,

25 second display means with respect to which an operation is performed in an operation mode that is different from an operation mode for said first display means is provided on one of said first housing and said second housing on a surface on a side opposite to a surface facing the other housing, and

30 when it is detected that said first housing and said second housing are folded together, an operation mode in said input processing step with

respect to said first display means and said second display means is altered.